CT MS4 General Permit: Impaired Waters Monitoring

IDDE Workshop

September 27, 2017
Outfall water quality monitoring in the 2017 MS4 Permit

... has changed since the 2004 MS4 Permit

... is different than IDDE outfall screening & sampling
Monitoring Requirements – What’s Changed?

2004 Permit
- Monitor 6 representative outfalls every year during a rain storm

2017 Permit
- Outfall sampling for discharges to impaired waters only
  - Representative outfall sampling in last 2 years of permit
  - Outfalls that exceed thresholds are targeted for further investigation and/or BMPs
What are “Impaired Waters”? 

Surface waters that do not meet state water quality standards for certain uses like recreation or aquatic life.
Outfall Monitoring is not IDDE Screening

Outfall Monitoring

- Focus on stormwater discharges
- Wet weather
- All outfalls to impaired waters
- Stormwater pollutants of concern

IDDE Screening

- Focus on illicit discharges
- Dry weather and wet weather
- Outfalls in priority areas (high and low priority catchments)
- Illicit discharge parameters and stormwater pollutants of concern
Impaired Waters Monitoring Requirements

Screen (i.e., sample) outfalls discharging directly to impaired waters

Outfalls
- Screening required
- Screening not required

Impaired River Segment
Impaired Waters Monitoring Requirements

Outfall Screening

• Collect sample during a rain event – wet weather
• Sample only for “pollutants of concern”
• If you have sampling results for an outfall from 2004 MS4 Permit sampling or other wet weather sampling, do not need to screen again
Wet Weather Sampling Criteria

• **Single grab sample taken within first 6 hours of discharge**

• **Any rain storm that produces a discharge from the outfall being monitored**

• **At least 48 hours after any previous rain storm that produced a discharge from the outfall**

• **Some snow or ice melt can be present, cannot be snow or ice melt alone**

*Different than the CTDEEP Industrial Stormwater General Permit*
Weather Monitoring Resources

• National Weather Service (NWS) Forecast Offices
  – Boston  http://www.weather.gov/box/
  – New York  http://www.weather.gov/okx/  

• Quantitative Precipitation Forecasts (QPFs), multi-day assessment of the probability of precipitation
  https://www.weather.gov/nerfc/ForecastPrecipitation

• After an event, to check storm totals, 24-hr precipitation information is available at:
  – https://www.weather.gov/nerfc/ObservedPrecipitation
  – https://www.weather.gov/nerfc/ObservedPrecipitationText

• Prior day weather information (including precipitation):

• Commercial weather vendor websites
Outfall Sample Collection Procedures

Direct Collection (preferred method)

• Fill bottles with flow from outfall
• Avoid touching the outfall pipe with the lip of the bottle
• Avoid disturbing bottom sediments or biofilm on inside of pipe
• If outfall is inundated or inaccessible, collect sample at nearest upstream location (typically in a manhole)
Outfall Sample Collection Procedures

Pole or Swing Sampler ($150)

- Use where direct collection is not possible (extends up to 24 feet)
- Use dedicated 1000 mL wide mouth sample bottle for use at each location
- Requires decontamination between sample locations
- If outfall is inundated or inaccessible, collect sample at nearest upstream location (typically in a manhole)
Clean Sampling Techniques

- Never re-use sample bottles
- Wear powder-free nitrile or latex gloves
- Change gloves if soiled or if potential for cross-contamination
- Do not touch the inside of the bottle or cap. Do not put the cap on the ground.
- No eating, drinking, or smoking or chewing tobacco during sample collection
- After each sample is collected, record the sample time and immediately place the bottles on ice in a cooler
Sample Analysis – Phosphorus & Nitrogen

Collect samples to deliver to lab or use portable N & P meter (requires digester)

<table>
<thead>
<tr>
<th>Pollutant of Concern</th>
<th>Threshold for Follow-up Investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>Total Nitrogen &gt; 2.5 mg/L</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>Total Phosphorus &gt; 0.3 mg/L</td>
</tr>
</tbody>
</table>
Sample Analysis – Bacteria

Collect samples to deliver to lab (6-hour hold times)

<table>
<thead>
<tr>
<th>Receiving Water</th>
<th>Indicator Bacteria</th>
<th>Threshold for Follow-up Investigation (colonies per 100 ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater</td>
<td>E. Coli</td>
<td>&gt;235 for swimming areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;410 for all others</td>
</tr>
<tr>
<td>Class AA, A and B surface waters</td>
<td>Total Coliform</td>
<td>&gt;500</td>
</tr>
<tr>
<td>Marine</td>
<td>Fecal Coliform</td>
<td>&gt;31 for Class SA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;260 for Class SB</td>
</tr>
<tr>
<td>Class SA and SB surface waters</td>
<td>Enterococci</td>
<td>&gt;104 for swimming areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;500 for all others</td>
</tr>
</tbody>
</table>

* No follow-up investigation needed if outfall exceeded levels *solely* due to natural sources (e.g., wildlife or runoff from undeveloped wooded area)
Other Pollutants of Concern

- Collect samples from outfall and in-stream immediately upstream of outfall
- Measure turbidity using portable meter

<table>
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<tr>
<th>Pollutant of Concern</th>
<th>Threshold for Follow-up Investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other (turbidity)</td>
<td>Difference between Outfall and Upstream Sample &gt; 5 NTU</td>
</tr>
</tbody>
</table>
In-Stream Sample Collection

- Place probe at 1/2 water depth where stream depth is greater than one foot
- If water depth too shallow to fully submerge the probe, collect water in a clean, spare, sample bottle or graduated cylinder
- Sample mid-stream
- Use pole sampler and dedicated bottle if unsafe to enter stream
- Use waders (and PFD) or hip boots, as necessary
- Two-person team recommended
Sample Handling and Custody

Laboratory analysis

- Place samples in cooler with ice
- Transport samples to laboratory immediately (6-hour hold time for bacteria)
- Complete and follow Chain-of-Custody procedures
Follow-up Investigations

Investigate activities within the drainage area

- Land use or development patterns
- Business or commercial activities
- Industrial activities
- DCIA
- Natural contributors
- Potential MS4 maintenance issues
- Residential activities

Visual assessments

Implement BMPs
Prioritized Outfall Monitoring

Screen ½ impaired outfalls

Select 6 outfalls with highest contributors of pollutants of concern

Sample these annually
## Impaired Waters Monitoring Schedule

<table>
<thead>
<tr>
<th>Program Element</th>
<th>Deadline</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Year 1</td>
</tr>
<tr>
<td>Wet Weather Outfall Screening: Start</td>
<td>X</td>
</tr>
<tr>
<td>Wet Weather Outfall Screening: ≥ 50%</td>
<td></td>
</tr>
<tr>
<td>Wet Weather Outfall Screening: 100%</td>
<td></td>
</tr>
<tr>
<td>Start Follow-up Investigations</td>
<td>X</td>
</tr>
<tr>
<td>Start Prioritized Outfall Monitoring (6 locations)</td>
<td></td>
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</table>

- **X** Existing 2004 MS4 permittees
- **X** New MS4 permittees
Wet weather monitoring has its unique challenges

• Start early, don’t put off monitoring until the year it’s due
  – Field work always takes longer in the rain
  – It never seems to rain during normal working hours

• Invest in up-front training for field staff
  – Your data (information) is only as good as your field team

• Decide how your are going to manage the data before you get started
  – Paper ➔ Spreadsheet ➔ GIS/Geodatabase
Questions / Discussion

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